REMARKS

Claims 1, 4-13 and 16-21 are pending in this application. By this Amendment, claims 1, 5, 6, 11, 13 and 16 are amended. Support for amended claim 1 may be found in the original specification at, for example, original claim 6. Support for amended claims 1, 6, 11, 13 and 16 may be found in the original specification at, for example, paragraphs [0049] and [0050]. No new matter is added.

The courtesies extended to Applicants' representative by Examiner Shikhman and Examiner Wu at the interview held December 6, 2007, are appreciated. The reasons presented at the interview as warranting favorable action are incorporated into the remarks below and constitute Applicants' record of the interview.

Claim Objections

Claims 1, 4, 5 and 13-18

Claims 1, 4, 5 and 13-18 were objected to as allegedly including an unclear term. In particular, the Patent Office alleges that the term "substituting data" is the same as "generating a hole-image."

As agreed upon during the interview, "substituting data" is not the same as "generating a hole-image." As such, withdrawal of the objection is respectfully requested.

Claim 13

Claim 13 was objected to for including a grammatical error. In particular, "data to to zero" should be "data to zero."

Claim 13 is amended to replace "data to to zero" with "data to zero." As such, withdrawal of the objection is respectfully requested.

Claim Rejections Under 35 U.S.C. §112, First Paragraph

Claim 1, 4, 5, 17 and 18 were rejected under 35 U.S.C. §112, first paragraph, as allegedly including subject matter that was not described in the specification as to reasonably

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convey to one skilled in the relevant art possession of the claimed subject matter. Applicants respectfully traverse this rejection.

Claims 1 and 17

The Patent Office alleges that it is unclear how zeros are presented in the sub-sampling hole image since zeros are allegedly ignored during averaging to form the sub-sampling hole image.

As agreed upon during the interview, claims 1 and 17 are clear as to how zeros are placed into the sub-sampling hole image, as a zero value is placed as the value of a sub-sample if the corresponding pixel neighborhood are all zeros.

As such, withdrawal of this rejection under 35 U.S.C. §112, first paragraph, is respectfully requested.

Claims 11 and 16

The Patent Office alleges the claims 11 and 16 provide a situation where division by zero is possible.

As agreed upon during the interview, claims 11 does not allow for division by zeros as division is only applied to non-zero values and claim 16 does not allow for division by zeros as only non-zero values are averaged.

As such, withdrawal of this rejection under 35 U.S.C. §112, first paragraph, is respectfully requested.

Rejection Under 35 U.S.C. §112, Second Paragraph

Claim 5 was rejected under 35 U.S.C. §112, second paragraph, as allegedly not including proper antecedent basis for the term "non-identified."

Claim 5 is amended to replace the term "the non-identified" with "non-identified."

As such, withdrawal of the rejection under 35 U.S.C. §112, second paragraph, is respectfully requested.

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Rejections Under 35 U.S.C. §103(a)

Claims 1, 4 and 5 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Ricardo L. de Queiroz, COMPRESSION OF COMPOUND DOCUMENTS (Xerox Corporation 800 Phillips Rd., 128-273, Webster NY, 14580) ("Queiroz") in view of U.S. Publication No. 2004/0201726 ("Bloom").

Claims 6-9 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Queiroz in view of Gonzalez, "Digital Image Processing, 2/E" (Prentice Hall, 2002, ISBN 0201180758) ("Gonzalez"), further in view of U.S. Publication No. 2003/0133617 ("Mukherjee").

Claims 10 and 11 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Queiroz, in view of Gonzalez, further in view of Bloom.

Claim 12 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Queiroz in view of Gonzalez, further in view of Bloom, further in view of Richardson "H.264 and MPEG-4 Video Compression: Video Coding Next Generation Multimedia," pages 16 17 ("Richardson").

Claims 13 and 16-21 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Queiroz, in view of Mukherjee.

Applicants respectfully traverse each of the above rejections.

Claim 1

None of the applied references, alone or in combination, teach or suggest a method for processing an image including identifying pixels in the image which are less critical, substituting data into identified pixels, the data being chosen to provide a desired characteristic for processing the image, generating a hole-image by setting to zero pixel values of pixels identified to be less critical to the image, sub-sampling the hole-image, by averaging only non-zero pixel values in pixel neighborhoods to obtain sub-sampled pixel

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values for the sub-sampled hole-image, wherein each of the sub-sampled pixel values has a non-zero value if a corresponding neighborhood has at least one non-zero pixel value, or a zero value if the corresponding neighborhood has all zero pixel values, averaging the non-zero sub-sampled pixel values of the sub-sampled hole-image to obtain an average value, and setting the sub-sampled pixel values of zero to the average value of the non-zero sub-sampled pixel values, as recited in claim 1.

Queiroz discloses labeling non-useful pixels with an "X" (alleged "zero pixel value") and useful pixels with a "U." In order to replace the "X" pixels with another value, Queiroz uses a multi-pass algorithm where pixels marked with an "X," and that have at least one vertical or horizontal neighbor pixel that is labeled "U," the "X" labeled pixel is replaced by the average of those neighboring pixels labeled "U." This process is continued until there are no "X" labeled pixels left (see page Queiroz, page 211, column 1).

In contrast, claim 1 takes the average of the non-zero pixel values in a pixel neighborhood that is generated from a hole-image (the "hole-image" is defined in the specification as part of the entire image that contains holes, see specification, paragraph [0044]) and averages the non-zero pixel values of the neighborhoods that make up the hole-image. This averaged value of the non-zero pixel values of the neighborhoods that make up the hole-image replaces all of the zero pixel values for the pixels within the hole-image. Further, if all of the pixels in a pixel neighborhood include zero values, the pixel neighborhood (now the sub-sampled pixels) will be represented by a zero value, as claim 1 only allows for non-zero pixel values to be averaged. Therefore, the zero value will later be replaced with the average of non-zero pixels of nearby sub-sampled pixels.

That is, the current claims allow for a less costly method that does not need an algorithm to be used at every "X" (alleged "zero pixel value") labeled pixel. The current claims find an average value of the non-zero pixels within a hole-image, and replaces all of

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the zero valued pixels within the hole-image with that value. In contrast, Queiroz uses a lengthy process of identifying and substituting each "X" valued pixel with the average of its neighboring pixels one at a time.

Further, even the alternative method of Queiroz on page 211 (labeled "4. Block Thresholding") that allows for sub-sampling will not achieve the same results as the method of claim 1 because unlike claim 1, Queiroz requires further sub-sampling if a block of 2x2 pixels all have the same intensity. That is, unlike claim 1, Queiroz will never have a situation where sub-sampled pixel values are all zeros. If a sub-sampled block in Queiroz (that is, a 2x2 block) has all "Xs", this block will be sub-sampled again by 2. In contrast, claim 1 does not further sub-sample 2x2 sub-samples if the 2x2 sub-sample has the same intensity. For example, a 2x2 set of pixels in a pixel neighborhood containing all zeros will obtain a value of zero for the entire sub-sample. This sub-sample will later be averaged with non-zero sub-sampled pixel values. Thus, Queiroz fails to teach or suggest each and every claim feature.

The Patent Office relies on Bloom as allegedly disclosing sub-sampling the hole image, by averaging non-zero pixel values in pixel neighborhoods to obtain sub-sampled pixel values for sub-sampled hole-image. However, as agreed upon during the interview, Bloom is related to a method of allowing a user to color balance an image before capturing a final image and therefore the alleged sub-sampled method of Bloom would not work with the method disclosed in Queiroz. Further, even if Bloom is relied on as allegedly disclosing the above feature, Bloom fails to remedy the deficiencies of Queiroz in disclosing or rendering obvious the features of claim 1.

Claim 6

The method of claim 6 includes the feature of sub-sampling a hole-image to obtain one or more blocks of sub-sampled pixel values, each of the sub-sampled pixel values having a non-zero value if a corresponding neighborhood has at least one non-zero pixel value, or a

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zero value if the corresponding neighborhood has all zero pixel values and averaging color values of only non-zero sub-sampled pixel values in each of the blocks to obtain a block average color value for each of the blocks. Therefore, for at least the same reasons discussed above with respect to claim 1 with respect to the method of sub-sampling, Queiroz fails to teach or suggest the features of claim 6.

The Patent Office relies on Gonzales as allegedly disclosing each of a sub-sampled pixel value having a zero value if the corresponding neighborhood has all zero pixel values. Not only does this conflict with the sub-sampling method disclosed in Queiroz as sub-sampled pixel values are further sub-sampled if they have the same intensity, even if Gonzales is relied on as disclosing this feature, Gonzales fails remedy the deficiencies of Queiroz in disclosing or rendering obvious the features of claim 6.

Claim 13

The apparatus of claim 13 includes the features of a sub-sampling processor that sub-samples hole-image data and averages only the non-zero data values in a block of the sub-sampled hole-image data to obtain a block average value, and a pixel substitutor which substitutes the block average value of only the non-zero data values for the zero values in the sub-sampled hole-image data. Thus, for at least the reasons presented above with respect to claim 1, Queiroz fails to teach or suggest the apparatus of claim 13 that averages only the non-zero data values in a block of the sub-sampled hole-image data to obtain a block average value, and substitutes the block average value of only the non-zero data values for the zero values in the sub-sampled hole-image data.

The Patent Office relies on Richardson as allegedly disclosing 4x4 neighborhoods of chroma data. However, even if Richardson is relied on as disclosing this feature, Richardson fails to remedy the deficiencies of Queiroz in disclosing or rendering obvious the features of claim 13.

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<u>Conclusion</u>

For at least the foregoing reasons, claims 1, 6 and 13, and dependent claims thereof, are patentable over the applied references. Thus, withdrawal of this rejection under 35 U.S.C. §103(a) is respectfully requested.

<u>Conclusion</u>

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1, 4-13 and 16-21 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Kevin K. Jones
Registration No. 56,809

JAO:KKJ/hs

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OLIFF & BERRIDGE, PLC
P.O. Box 320850
Alexandria, Virginia 22320-4850
Telephone: (703) 836-6400

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